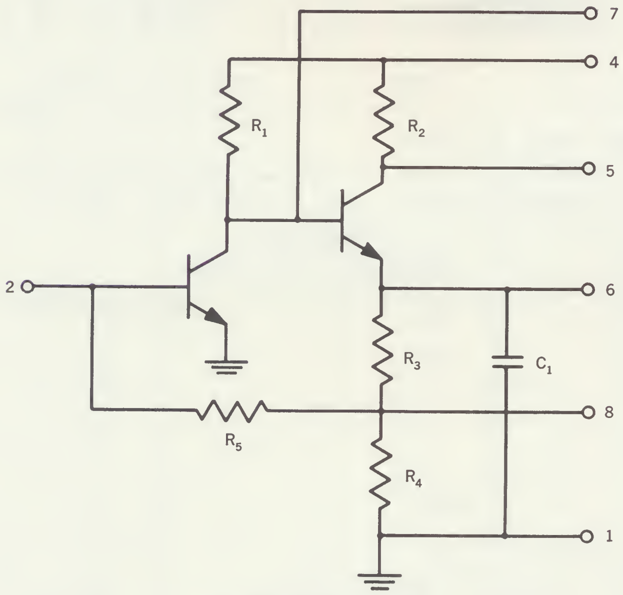
Equivalent circuit

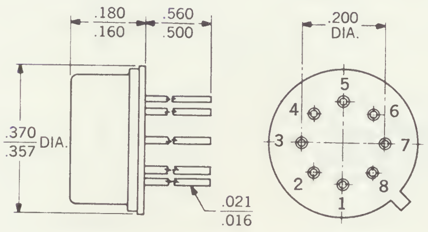


Nominal Resistor Values

R_1 = 2.2 K	R_4 = 600
R_2 = 1.3 K	R_5 = 3.9 K
R_3 = 1.8 K	C_1 = 10 pf

Package

T style (EIA Registration Pending)



Pin connections

1 ground
2 input and AGC
3 no connection
4 supply voltage
5 output collector
6 output emitter
7 AGC
8 feedback network

Description and application

The WC 1146 wideband amplifier is a direct coupled, two stage amplifier with negative feedback and shunt peaking. The negative feedback assures a very stable operation over a wide temperature range, and the shunt peaking circuit provides increased bandwidth. Output is available at either pin 5 (collector) or pin 6 (emitter) as required by the specific application. AGC or external tuning networks may be applied through pin 7.

The WC 1146 has a wide range of applications in both industrial and commercial communications, as well as radar systems. With the WC 183 low level audio amplifier it permits integration of low power receivers and transmitters. External connections to all circuit nodes allow a maximum in custom application flexibility. Up to four WC 1146 wideband RF amplifiers have been cascaded to provide high overall gains (85db). Cascading the units with frequency selective elements produces a wide range of IF amplifiers with AGC capabilities. In addition, an oscillator mixer stage can be created by using an external crystal.

Design features

- Usable range DC to 85 MHz
- Gain 16 db @ 60 MHz
- 6 VDC to 12 VDC operation
- Low power dissipation
- Only one power supply required

Quality assurance

Guaranteed by statistical quality assurance methods:

- DC and AC electrical parameters
- Centrifuge 20,000G
- Thermal shock 3 cycles—65°C to +100°C
- Package hermeticity
- Group B per MIL-STD-750

Product meets environmental requirements of MIL-S-19500. Quality assurance provisions meet MIL-Q-9858A, and NASA 200-3 requirements.

Absolute maximum ratings ①

Parameter	Symbol	Value	Units
power supply	V_{cc}	+16	VDC
storage temp.	T_{stg}	−65 to 175	°C
operating temp.	T_{opg}	0 to 75	°C

Typical electrical characteristics

Parameter	Symbol	Min.	Typical	Max.	Units
Electrical characteristics for V_{cc} = +12 volts and at 25°C					
Insertion power gain ②	P_g	18	23		db
Admittance parameters (60 MHz)					
(in terms of R and C)					
Pin 2	R_{11}		82		Ω
(Pin 5)	R_{22}		624		Ω
Pin 2	C_{11}		14.8		pf
(Pin 5)	C_{22}		13.2		pf
Impedance parameters (60 MHz)	R_{11}		83		Ω
	R_{22}		1900		Ω
	C_{11}		22		pf
	C_{22}		15		pf
Upper frequency roll-off (−3 db) ②	f_h	30	45		MHz
Noise figure ③	N.F.		4		db
Output swing, pin 5 (no load)			2.5		V p-p
Output swing, pin 6 (no load)			6.0		V p-p
Power supply current	I_{cc}		3.5	7.0	ma
Input bias current	I_B		0.5		ma
Output drift voltage	V_D		0.23		mv

① Limiting values beyond which the serviceability of the unit may be impaired
② Measured in the test circuit shown below with R_L = 330Ω
③ Measured with 100Ω source resistor, bandwidth >100 kHz

Test circuit

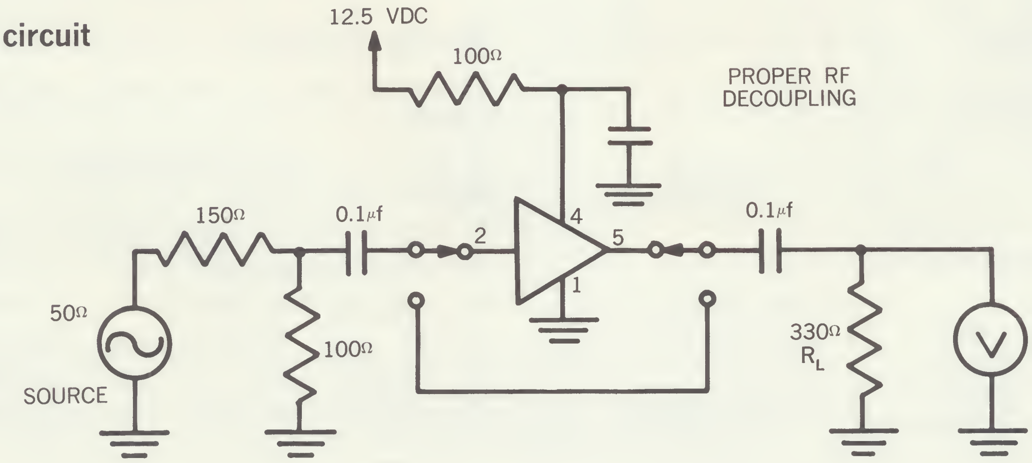
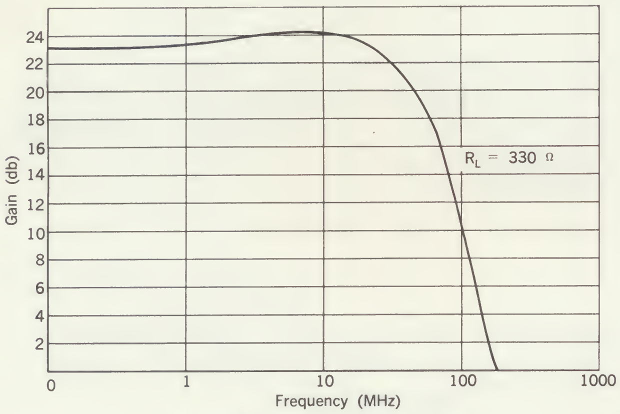


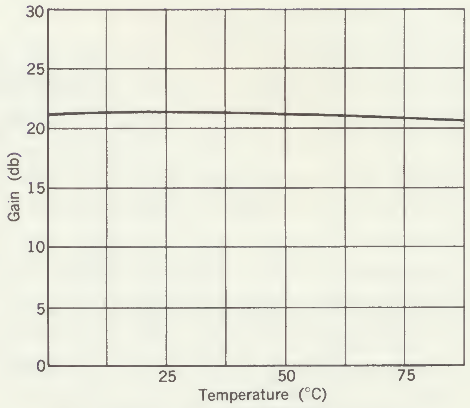
Figure 1

Note: Refer to fig 1 for test circuit unless otherwise shown.
V_{cc} = 12.0 volts



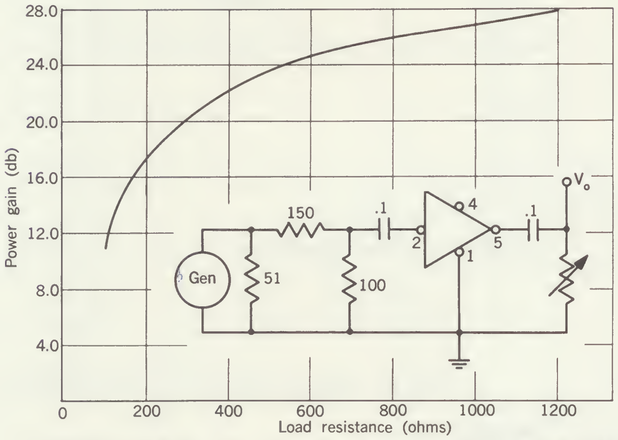
GAIN VS FREQUENCY

Figure 2



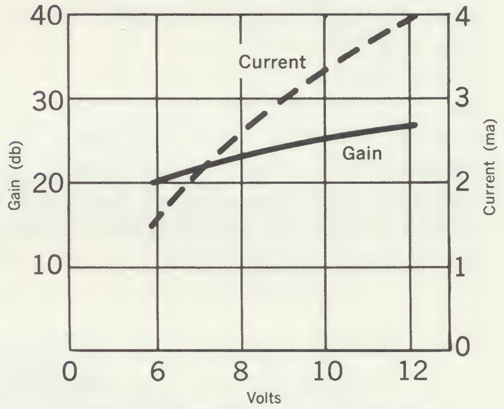
GAIN VS TEMPERATURE

Figure 3



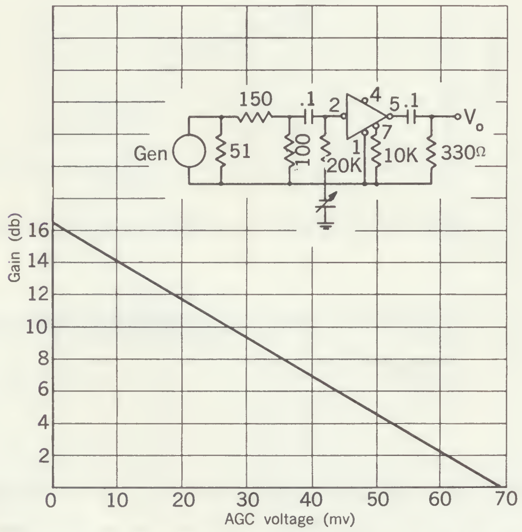
POWER GAIN VS LOAD RESISTANCE AT 1 MHz

Figure 4



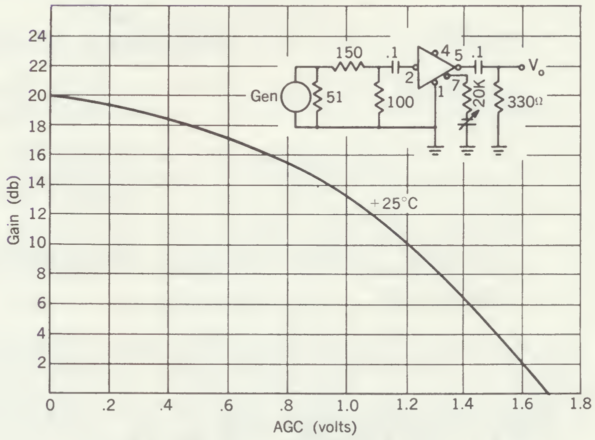
GAIN AND BLOCK CURRENT
VS BLOCK VOLTAGE

Figure 5



GAIN VS AGC VOLTAGE AT 1 MHz

Figure 6

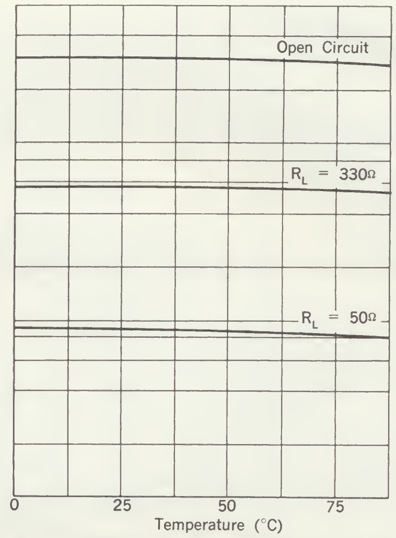


GAIN VS AGC VOLTAGE AT 1 MHz
AGC Applied at 2nd base (pin 7)

Figure 7

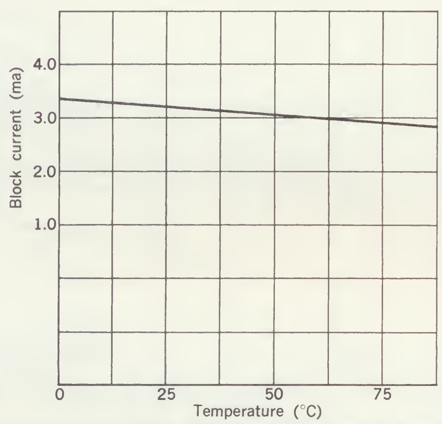
Temp. (°C)	AC Swing @ 1.0 MHz Emitter Output Voltage (p-p)		
	50Ω	330Ω	Open Ckt.
25	.08	.7	6.0
75	.064	.45	4.0

Figure 8



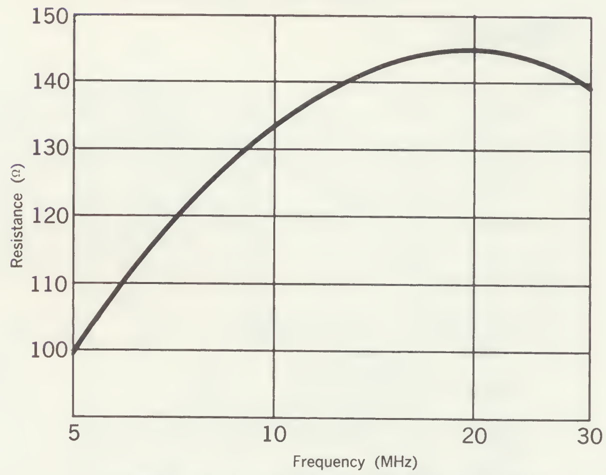
AC SWING VS TEMPERATURE
COLLECTOR OUTPUT AT 1 MHz

Figure 9



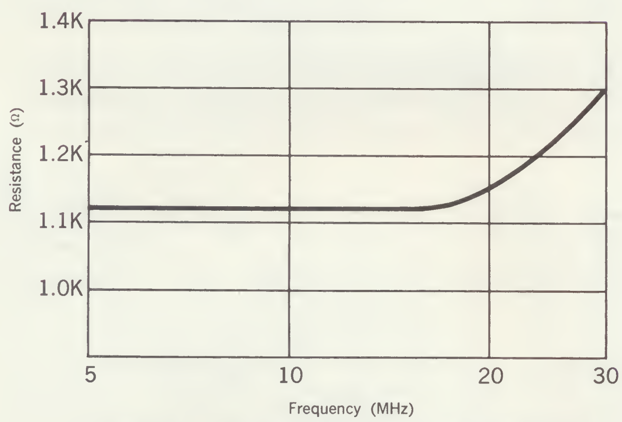
BLOCK CURRENT VS TEMPERATURE

Figure 10



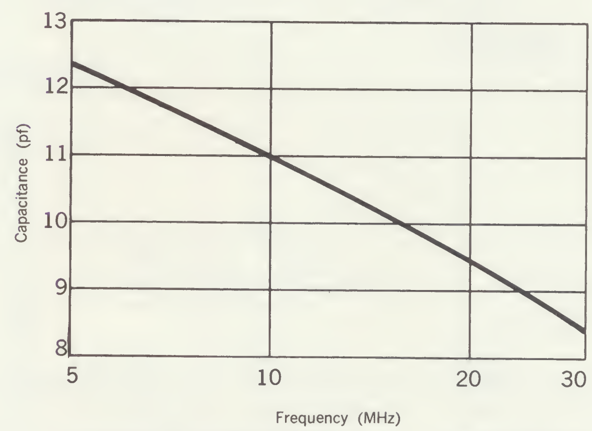
INPUT RESISTANCE VS FREQUENCY

Figure 11



OUTPUT CAPACITANCE VS. FREQUENCY

Figure 12



OUTPUT CAPACITANCE VS. FREQUENCY

Figure 13

All values shown subject to design change for product improvement.